Standards Way Ahead  
February 2012

Since the institution of the Office of the Program Manager for the Information Sharing Environment (PM-ISE), the Office has worked with its mission partners – federal, state, local, tribal, industry, and international – to develop guidelines, policies, standards, and architecture for responsible information sharing. The current vision for information sharing and safeguarding is for all ISE partners to:

*“Ensure that any person with the appropriate mission need can discover and access actionable information at the right time to successfully prevent harm to the American people and protect national security. Sharing must be done responsibly, seamlessly, and securely with safeguards to protect privacy, civil rights and civil liberties”.*

The call to action for ISE partners is to accelerate delivery of the ISE capabilities throughout the information lifecycle while achieving productivity gains and reducing risk. Going forward, ISE partners must make informed investment decisions using shared resources, harmonize policy, rationalize business processes, integrate standards activities, and deploy technology to realize joint objectives and requirements.

In an effort to strategically engage partners, the PM-ISE conducted the Workshop on Information Sharing and Safeguarding Standards (WIS3) in December 2011, to unite as a community to discuss the challenges and opportunities within standards-based information sharing.

The purpose of this document is to: 1) put forward guiding objectives for coordination of information sharing and safeguarding standards activities, and 2) provide a baseline set of recommendations and activities to develop a long-term roadmap and standards lifecycle. The shared objectives include:

* **Mission-driven:** ISE capabilities and standards must serve all mission partners’ requirements and enhance operational effectiveness as a result of information and service sharing while better managing costs.
* **Shared resources:** Reuse is an important aspect to ISE efficiency, effectiveness, and agility. Standards, architectures, systems, and tools of mission partners are more relevant and easily integrated when capable of serving, not only the counter-terrorism function, but also providing additional integrated mission-capabilities.
* **Integrated governance:** Governance is a key component to making the ISE capabilities efficient and effective across diverse jurisdictions and mission processes. Leveraging a multi-lateral structure including government, standards development organizations (SDO), and industry improves the information sharing dialogue.

The strengths of each of the ISE partners can be utilized to innovate and deploy new approaches and tools and to streamline governance processes to more effectively share resources and achieve interoperability between standards and systems. PM-ISE will coordinate with federal, state, local, tribal, industry, and international mission partners via the ISA-IPC to identify requirements, functional requirements, and action items. The actions set forth in this report and the future roadmap must meet the needs of the mission users - analysts, investigators, and operators on the frontline. SDO’s and other non-governmental organizations must work within their respective communities to gather business requirements and identify members that can help execute the roadmap. One of the first recommendations is to convene a Standards Coordinating Council (SCC) to facilitate the completion of this report, a subsequent roadmap, and the creation of standards lifecycle. It is expected that each action item will have a corresponding SCC Lead Organization that will take ownership of the actions in this report and provide status updates.

**The recommendations and activities in this report are considered notional until formal partner feedback is received. In some cases more than one owner is listed until an SCC partner agrees to directly own the action. The information in this report is meant to foster discussion and to finalize a roadmap to coordinate standards activities across the SCC partners.**

The recommendation categories include:

1. Standards Coordination and Governance
2. National Information Exchange Model (NIEM) Scalability and Adoption
3. Standards Development and Interoperability
4. Identity and Access Management
5. Policy Automation
6. Integrating Geospatial into the ISE
7. Procurement and Standards Testing and Certification

# Standards Coordination and Governance

Governance plays a critical role in determining the specific priorities for information sharing and safeguarding. A multi-lateral structure including all partners is necessary to ensure collective decision-making given the convergence of multiple missions and resources. Informed decision making begins with a standardized, integrated approach to gathering, analyzing and reporting information. The architecture, methodologies, and technologies used to build the ISE rely upon standards. Standing up the SCC is the first step in convening mission partners to streamline standards development activities.

| **Category Overview** | |
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| **Business Value** | * Integrated governance model to streamline standards development activities and to enhance communication, collaboration, and consensus between partners * Coordinated network to conduct communications and outreach of standards development results to broader stakeholder audiences (leverage ISE annual report and industry events) * Adoption of high value standards initiatives owned and driven by SDOs and industry organizations designed to advance information sharing |
| **Relevancy to other recommendations** | * SCC serves as the umbrella to drive completion of all recommendations and actions * Partner organizations and their membership have responsibility for individual actions to fulfill the vision of the SCC and integrated roadmap |

| **Action Item Overview** | | | |
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| **Action** | | **SCC Lead Organization** | **Description** |
| Short-term  *(1 - 3 months)* | Convene ISE Standards Coordinating Council | PM-ISE, SCC Partners | * Discuss next steps and way ahead on the formation of this council * Solicit current standards challenges that can be minimized leveraging the SCC * Understand individual organization objectives for the SCC and how the SCC can be used to define a standards roadmap and enhance collaboration and transparency across organizations. |
| Develop a Roadmap to Reflect Standards Activities | SCC Partners | * Gain commitment from individual organizations to a “Standards Way Ahead” report and formalize milestones |
| Consolidate Existing Governance Structures | PM-ISE | * Define a strong and transparent governance model for standards across mission partners * Align SCC under the Information Sharing and Access Interagency Policy Committee (ISA-IPC) * Identify the relationship between the SCC and the Standards Working Group (SWG) |
| Long-term  *(3+ months)* | Conduct Standards Communication and Outreach | SCC Partners | * Leverage ISE stakeholder analysis results to identify additional opportunities to engage broader stakeholder audiences * Target industry vendors through SDOs and other forums to communicate value proposition of in-progress or completed standards activities * Coordinate across SDO and other industry events to communicate accomplishments * Publicize results via ISE annual report and other partner publications |
| Conduct Annual Standards Summit | PM-ISE, SCC Partners | * Conduct WIS3 follow-up briefing driving leadership and coordination across partners   + Communicate accomplishments   + Present roadmap for 2013 |

# National Information Exchange Model

Over the last several years, NIEM has made many accomplishments including: strengthened the overall management approach of the program, increased community participation through an aggressive communications campaign, and rolled out an extensive training program for implementers to reduce complexity of using the model. Given the current fiscal pressures, NIEM still has opportunities to identify innovative strategies to scale governance, build a sustainable business model to include shared approaches and efficiencies, and to foster the broader engagement of industry.

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| **Category Overview** | |
| **Business Value** | * Governance structure that integrates and supports continuous cooperative development, testing and adoption by industry and the user community * Innovative program that is sustainable through the upcoming austere budget environment * An ecosystem approach to the development of NIEM that increases the value proposition across the broad set of stakeholders * Expanding participation in the NIEM model and tool development to reduce operational costs and broaden adoption |
| **Relevancy to other recommendations** | * Completion of activities such as the NIEM Unified Modeling Language (UML) Profile link directly to the development of functional standards and continued interoperability between standards and systems |

| **Action Item Overview** | | | |
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| **Action** | | **SCC Lead Organization** | **Description** |
| Short-term  *(1 - 3 months)* | Finalize NIEM UML Profile | NIEM PMO, PM-ISE and OMG | * February 2012 - submit draft for OMG Task Force review * March 2012 – support comment review process * Integrate NIEM UML profile into existing NIEM training |
| Assess long-term NIEM business models | NIEM PMO | * Work with the NIEM Executive Steering Council (ESC) to agree to next steps on longer-term business models and governance approaches |
| Long-term  *(3+ months)* | Continued Marketing of NIEM UML Profile | NIEM PMO, PM-ISE, OGC, and OMG | * Continue engaging with vendor community * Look for opportunities to integrate with interoperability pilots and leverage industry initiatives such as Springboard. * Report results through annual report, industry events, and online videos/tutorials. |
| Integrate NIEM and UCore | NIEM PMO and PM-ISE | * NIEM PMO and PM-ISE representatives to continue to participate in Universal Core (UCore) Governance and Technical working groups * Further coordinate with SDOs * Assess impact of UCore / NIEM harmonization on NIEM UML profile. |

# Standards Development and Interoperability

The use of standards implies adherence to the governance processes of the SDOs and within communities of interest (COI) which will yield the requirements, in the form of standards and profiles, design patterns, and support services, required to make information sharing and interoperability a reality. Properly promoting standards and systems will sustain innovation and foster competition. Government must take a convening or active engagement role in SDOs. ISE partners must work together to identify technical and business requirements, the current and future standards needed to complete the interoperability stack, and to integrate these standards into a framework that will enhance information sharing. As technical products are developed, they need to support independent and interoperable use to meet a range of business needs.

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| **Category Overview** | |
| **Business Value** | * Acceleration of information sharing through the use of interoperable standards and solutions |
| **Relevancy to other recommendations** | * Coordination of interoperability standards and initiatives should be done in alignment with the broader objectives of the SCC |

| **Action Item Overview** | | | |
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| **Action** | | **SCC Lead Organization** | **Description** |
| Short-term  *(1 - 3 months)* | Coordinate SOA Activities | IJIS | * Bring together representatives of current service oriented architecture (SOA) Frameworks including Department of Homeland Security (DHS), Department of Defense (DoD) Defense Common Ground Systems (DCGS), Intelligence Community (IC), and Department of Justice (DOJ) Global Reference Architecture (GRA) to evaluate opportunities for demonstration implementations   + Launch demonstrations as part of the broader set of interoperability pilots (Long-term goal) |
| Reference IEPD development | IJIS, GSC | * Finalize current list of reference information exchange package documentation (IEPD) identified by GSC and via the Public Safety Business Model   + Leverage project candidates awarded “Best of NIEM”   + Review current standards in existing repositories   + Other high priority exchanges may include: Emergency Management Patient Record, Suspicious Activity Reporting (SAR), Rap Sheet, Request for Information (RFI), Fingerprint Specification, and other Biometric Standards. * Build out service specification packages for reference IEPDs and identify reusable business objects * Evaluate based on maturity against ISE capabilities and partner mission requirements |
| Long-term  *(3+ months)* | Align the UML Profile for DoDAF and MODAF (UPDM) and Model for Performance-driven Government (MPG) models | OMG, PM-ISE, and ACT-IAC | * Complete a more detailed analysis of these models to determine areas of integration and define scenarios and use cases where applicable |
| Conduct Interoperability Pilots | IJIS, OMG and PM-ISE | * Work with IJIS and other partners to agree to interoperability framework project definition   + Clearly outline capabilities to be tested against desired timeline; develop use cases   + Identity potential projects based on level of maturity and relevancy to capabilities   + Gain commitment from government and industry partners * Initiate pilots and report on results |
| Enable Access to NIEM via Semantic Technology Utilities | DoD, HHS and NIEM PMO | * Align key semantics between domains to support interoperability. * Leverage OMG and W3C standards * Leverage lessons learned from Virtual Electronic Health Records (VLER) * Identify authoritative data sources * Define a mapping ontology from the authoritative data sources and referenced by NIEM to a corresponding ontology based upon World Wide Web (W3C) Resource Description Framework (RDF) and Web Ontology Language (OWL) standards |

# Identity and Access Management

Access to information must be controlled to ensure the right people are able to access the right information to complete their mission objectives. With the appropriate safeguards in place, it is easier to know who is accessing the data and what authorities they have, to prevent inappropriate access/release. Specific consideration needs to be given to security, authentication and access, privacy protections and information quality. Partners must work together to promote further development of identity management standards and solutions.

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| **Category Overview** | |
| **Business Value** | * Collective approach to developing identity access management standards and solutions * Common approach to the policies, guidance and standards to manage the risk associated with sharing and safeguarding information across all network domains |
| **Relevancy to other recommendations** | * Core recommendation is to align governance to allow broader representation for state, local, tribal and private sector participation; this activity should be closely coordinated with the SCC * Identity and Access Management efforts are closely aligned with policy automation |

| **Action Item Overview** | | | |
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| **Action** | | **SCC Lead Organization** | **Description** |
| Short-term  *(1 - 3 months)* | Integrate Identity and Access Management Governance Structures | PM-ISE and GSA | * Work with the Federal Chief Information Officer’s Council and Identity, Credentialing and Access Management Sub-committee (ICAMSC) to determine the best way to align identity and access management governance |
| Align Identity and Access Frameworks | PM-ISE, GSC, CNSS, and GSA | * Align Global Federated Identity and Privilege Management (GFIPM) and the Federal Identity, Credential and Access Management (FICAM) frameworks * Certify the National Information Exchange Federation (NIEF) as a FICAM Trust Framework Provider, including adoption of GFIPM that is FICAM compliant * Align the GFIPM and FICAM SAML Profiles * Draft a plan for implementation of FICAM on the Federal secret networks. |
| Long-term  *(3+ months)* | Implement Recommendations from AFEI Report titled “[Industry Comments and Recommendations for Federated Identity Management](http://www.afei.org/WorkingGroups/PMISEWG/Documents/Identity%20CHallenges%20Working%20Draft.pdf)[[1]](#footnote-1)”. | PM-ISE, GSA and AFEI | * Clarify the applicability of policy requirements to logical vice physical access control, especially for logical access to information systems with a broad user base across government and industry * Create implementation guides including specific “build to” requirements, specifications and/or profiles that can be used across Federal agency information systems to encourage interoperability * Develop and communicate a holistic view of the federated identity management ecosystem, including actions government and industry can take to support the viability of the ecosystem for all participants * Develop a lexicon of applicable terminology, including differences in usage across communities |
| Complete a Backend Attribute Exchange (BAE) Pilot | GSA and PM-ISE | * Integrate current technical components to provide a BAE infrastructure * Conduct a pilot to demonstrate BAE business case across mission partners * Incorporate exchanges to demonstrate audit and reporting requirements * Align GFIPM and FICAM Security Assertion Markup Language (SAML) profiles |

# Policy Automation

Many decisions to share information are based on policy and law. However, the decision to share this information is often a time consuming manual process that impedes or delays the sharing of critical information. This is especially true in privacy where laws and policies are open for interpretation and vary by community or district. Instead, it is desired that these decisions are automated by translating policies to machine readable formats, and through the use of robust metadata and ontologies.

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| **Category Overview** | |
| **Business Value** | * Development of reusable agreements provides opportunities for cost efficiencies and fosters reuse * Improved ability to determine data ownership * Develop/define/discover information sharing and privacy rules that guide behavior and appropriate information sharing |
| **Relevancy to other recommendations** | * Policy automation activities are closely aligned to identity and access management * The privacy dictionary and related terms should be considered for incorporation into NIEM |

| **Action Item Overview** | | | |
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| **Action** | | **SCC Lead Organization** | **Description** |
| Short-term  *(1 - 3 months)* | Develop Optimized Process and Template for Information Sharing Agreements | DHS, PM-ISE, GSC | * Gain agreement on process and template for developing information sharing agreements and identify privacy implications |
| Long-term  *(3+ months)* | Complete a Privacy Rule Dictionary | NIEM PMO, GSC, and PM-ISE | * Work with relevant governance councils to identify common terms and definitions for privacy |
| Develop Privacy Profiles | NIEM PMO, GSC, and OMG | * Leveraging the privacy rule dictionary, work with OMG to develop additional profiles to support privacy policy management and automation |
| Incorporate Security and Privacy Tagging within NIEM | NIEM PMO, GSC | * Explore opportunities with NIEM PMO to conduct a pilot to dosecurity, privacy and classification tagging within NIEM   + Tie to DoD and IC Information Security Markings (IC-ISM) activities |

# Integrating Geospatial into the ISE

ISE partners are relying more broadly on geospatial standards and technologies to collect and analyze situational awareness data. Appropriate governance structures are necessary to coordinate policies, processes, governance and standards for geospatial activities. Requirements need to be identified for accessing geospatial data across jurisdictional boundaries. Incorporating geospatial data elements into existing exchanges can provide added business value.

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| **Category Overview** | |
| **Business Value** | * Coordinated approach to how government and private sector apply geospatial principles and share information * Integrated forum for decision makers and mission stakeholders to coordinate management activities and to share resources |
| **Relevancy to other recommendations** | * Align to UCore 3.0 implementation and convergence of NIEM and UCore |

| **Action Item Overview** | | | |
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| **Action** | | **SCC Lead Organization** | **Description** |
| Short-term  *(1 - 3 months)* | Conduct Outreach to Geospatial Practitioners | NIEM PMO and OGC | * Work with OGC to conduct more targeted communications on how to leverage NIEM and the framework of internationally adopted open geospatial standards for geospatial exchanges. |
| Align Geospatial Governance Structures | DHS and PM-ISE | * Assess current objectives and activities of geospatial governance structures and standards and make recommendations for alignment * Establish a mutually agreed upon geospatial policy memorandum with Federal geospatial communities * Coordinate geospatial communities via state, local and tribal outreach and governance bodies * Leverage the recently created US Federal Geographic Data Committee. |
| Long-term  *(3+ months)* | Incorporate Visualization Metadata into NIEM | NIEM PMO, OGC | * Work with DHS Geospatial office and OGC to tie in visualization metadata into NIEM and to align to broader DHS Geospatial Concept of Operations |
| Harmonize Geospatial Best Practices and Standards | NIEM PMO, OGC | * Assess existing geospatial best practices and draft implementation guidance * Coordinate with DoD and IC communities (Ex: NGA led Geospatial-Intelligence Standards Working Group) to harmonize geospatial requirements * Leverage / optimize the existing geospatial standards framework within and in combination with NIEM |
| Conduct a Geospatial Interoperability Pilot | PM-ISE, NIEM PMO, OGC and GSA | * Launch a pilot that reuses the NIEM UML Profile and FICAM for attribute-based access controls, and open geospatial standards on the Secure But Unclassified (SBU) fabric * Leverage SDO test beds (OGC as an example) to directly address geospatial / location standardization requirements. * Demonstrate geospatial secure search, discovery and access to fusion centers, state, local and tribal stakeholders * Produce an Engineering Report detailing the standards and interoperability best practices that can be scaled for community implementation |

# Procurement and Standard Testing and Certification

Given today’s economic challenges, ISE partners must explore new operating models to continue to meet business needs. Standards, services, and profiles need to be readily available to enhance both their discovery and usability. ISE partners need to leverage open standards instead of developing new proprietary standards and solutions. The use of these standards must be mandated in solicitations and grants to drive reuse. A process is needed to define and enhance the testing, certification, and discovery of standards, profiles, and IEPDs for specific business needs. ISE partners can work together to catalyze advances, promote market-based innovation and encourage competitive market outcomes.

| **Category Overview** | |
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| **Business Value** | * Maximize the use of funds and resources * Common operating policies and guidance for a single nation-wide approach to delivering information sharing standards and services * Lower cost of development and ownership and increased business agility * Conformance of commercial products to standards to ensure interoperability |
| **Relevancy to other recommendations** | * Clarity in standards activities and a coherent interoperability framework will facilitate the development of procurement and grant guidance and testing and certification of standards and tools |

| **Action Item Overview** | | | |
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| **Action** | | **SCC Lead Organization** | **Description** |
| Short-term  *(1 - 3 months)* | Conduct Federal Passback Data Call on Standards Reuse | PM-ISE | * Assess current use of standards across Federal agencies and make recommendations to impact policy and management regulations |
| Long-term  *(3+ months)* | Conduct Rollout of Springboard | IJIS | * Test the Springboard Concept of Operations leveraging pilot projects selected as part of the interoperability efforts * Develop a test environment and refine service specification and testing templates as needed * Develop an Applied Standards Repository |
| Develop Procurement Guidance | PM-ISE and GSA | * Provide acquisition stakeholders and program managers with resources to identify standards available for reuse, where to find them, and how to evaluate solicitation and grant responses * Leverage SCC participants for lessons learned and examples of standards acquisition language |

Appendix A – Participating Organizations

Program Manager, Information Sharing Environment (PM-ISE)

Object Management Group (OMG)

Organization for the Advancement of Structured Information Standards (OASIS)

Open Geospatial Consortium (OGC)

National Information Exchange Model Program Management Office (NIEM PMO)

Integrated Justice Information Systems (IJIS) Institute

American Council for Technology and Industry Advisory Council (ACT-IAC)

Association for Enterprise Information (AFEI)

Global Standards Council (GSC)

1. http://www.afei.org/WorkingGroups/PMISEWG/Documents/Identity%20CHallenges%20Working%20Draft.pdf [↑](#footnote-ref-1)